

## II Encuentro Matemático del Caribe

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# Numerical Study of Post-Blowup Dynamics in the Nonlinear Schrödinger Equation

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### Resumen

The Nonlinear Schrödinger equation (NLS) arises in different physical models as Bose-Einstein condensation, fluid dynamics and nonlinear optics. In the critical case, some NLS solutions undergoes a singularity in finite time indicating that some of the small terms neglected in the derivation of the NLS become important near the singularity.

In the literature, there are several possible ways to continue the singular solutions after the critical time: Nonlinear damping, nonlinear saturation, nonparaxiality and normal dispersion. In this talk, we are interested in introduce and study the non-conservative perturbation with nonlinear damping.

Since small damping will cause a slow change of the solution, the quantum adiabatic theorem is considered in the literature. However, applying this adiabatic approximation is not straightforward due to the nonlinearity of the equation.

In this study, we use numerical simulations in order to observe details of the post-blowup dynamics, including the detailed study of adiabatic term and non-adiabatic transitions.

*This is a joint work with Alexei A. Mailybaev.*

**Palabras & frases claves:** Nonlinear Schrödinger equation, singular solutions, non-linear damping, adiabatic theorem.

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## Referencias

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